

## CLAIMS

1. A method of creating a compressed trace for a program, said method comprising:  
selecting a sequence of events for said program;  
obtaining a sequence of values for each of said events, which values were obtained by  
executing said program;  
compressing each said sequence of values to generate a compressed sequence of values  
for each event, wherein the collection of compressed sequences of values of events  
generates a compressed trace; and  
ordering said values of said compressed trace to generate an uncompressed trace of said  
program.
2. A method as recited in claim 1, wherein said values of said compressed trace are  
ordered in accordance with information in selected events.
3. A method as recited in claim 1, wherein said sequence of events for said program is  
selected by dividing said program into blocks of instructions and by associating an event  
with selected instructions in a block.
4. A method as recited in claim 3, wherein said program is divided into said blocks  
according to the occurrence of a branch instruction, where each block has only one  
branch instruction which is the last instruction in each said block.
5. A method as recited in claim 1, wherein each said sequence of values for each said  
event is compressed based upon recognized patterns in each said sequence.
6. A method as recited in claim 5, wherein said recognized patterns comprise at least one  
of the following patterns: strided patterns and repeat patterns.

7. A method as recited in claim 1, wherein said selected events are branch instructions and wherein values for latter said selected events are branch targets taken by said branch instructions.

8. A method as recited in claim 2, wherein said information comprises target addresses and wherein said selected events comprise branch instructions.

9. A method as recited in claim 1, further comprising the step of:

using said compressed sequence of values for an event corresponding to a load instruction to pre-fetch values during the execution of a program.

10. A method as recited in claim 1, further comprising the step of:

using said compressed sequence of values for an event corresponding to a branch instruction to perform branch prediction during the execution of a program.

11. A method as recited in claim 1, further comprising:

dividing said compressed trace into segments, wherein said sequence of compressed values in a segment corresponds to a contiguous sequence of values in said uncompressed trace.

12. A method as recited in claim 11, wherein a segment is terminated at the end of a block such that the size of the segment is between two predetermined values.

13. A program storage device readable by a digital processing apparatus and having a program of instructions which are tangibly embodied on the storage device and which are executable by the processing apparatus to perform a method of creating a compressed trace for a program, said method comprising:

selecting a sequence of events for said program;  
obtaining a sequence of values for each of said events, which values were obtained by executing said program;  
compressing each said sequence of values to generate a compressed sequence of values for each event, wherein the collection of compressed sequences of values of all events generates a compressed trace; and  
ordering said values of said compressed trace to generate an uncompressed trace of said program.

14. A program storage device readable by a digital processing apparatus and having a program of instructions which are tangibly embodied on the storage device and which are executable by the processing apparatus, wherein said program modifies a user program to perform a method of creating a compressed trace for a program, said method comprising:

selecting a sequence of events for said program;  
obtaining a sequence of values for each of said events, which values were obtained by executing said program;  
compressing each said sequence of values to generate a compressed sequence of values for each event, wherein the collection of compressed sequences of values of all events generates a compressed trace; and  
ordering said values of said compressed trace to generate an uncompressed trace of said program.

15. An apparatus for creating a compressed trace of a program, said apparatus comprising:

means for selecting a sequence of events for said program;  
means for obtaining a sequence of values for each of said events, which values were obtained by executing said program;

means for compressing each said sequence of values to generate a compressed sequence of values for each event, wherein the collection of compressed sequences of values of all events generates a compressed trace; and  
means for ordering said values of said compressed trace to generate an uncompressed trace of said program.